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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/879,480	06/12/2001	Jack C. Whittier	HrdMgmtCIP	6452
7590 01/12/2007 Santangelo Law Offices, P.C. Third Floor 125 South Howes Fort Collins, CO 80521			EXAMINER MYERS, CARLA J	
			ART UNIT	PAPER NUMBER
			1634	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
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Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 09/879,480	Applicant(s) WHITTIER ET AL.	
	Examiner Carla Myers	Art Unit 1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 28,30-46,49 and 50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 28,30-46,49 and 50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>10/3/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 3, 2006 has been entered.

Claims 28, 30-40, 45, 46, 49 and 50 are pending. All rejections not reiterated herein are hereby withdrawn. In view of the amendments to the claims, this action contains new grounds of rejection and is made non-final.

Information Disclosure Statement

2. In the information disclosure statement filed in this application on October 3, 2006, the Office actions cited in the IDS do not comply with the requirements of 37 CFR § 1.98 because these Office actions are not published documents. The citations to the Canadian Office action has been lined through on the IDS because this citation is not in conformance with 37 CFR § 1.98. Additionally, the citations to Ozhin, Prokofiev, Solsberry, Wintzer and van Munster have not been considered by the examiner and have been lined through. In the response, Applicant included a statement that Ozhin "may include disclosure relative to artificial insemination of farm animals;" Prokofiev "was cited in an application that may involve technology relevant to that of the instant application;" Solsberry "may include disclosure relative to artificial insemination of cows;" Wintzer "may include disclosure

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relative to artificial insemination;" and van Munster "may include disclosure relative to sex determination with interferometry." However, these vague statements of what the documents "may" disclose do not provide a sufficient explanation of the relevance of each of the cited non-English documents. An explanation of what the documents do in fact disclose is required, as set forth in MPEP 609. Further, the citations to "Milk Production and Biosynthesis" and "Managing the Dairy Cow During the Dry Period" have not been considered and has been lined through because a publication date for this reference was not provided.

The other items of information that are otherwise in compliance with the provisions of 37 CFR §1.97-1.98 have been considered by the examiner.

Priority

3. The subject matter of the present claims is entitled to priority only to the instant filing date of June 12, 2001. A claim as a whole is assigned an effective filing date rather than the subject matter within a claim being assigned individual effective filing dates. The priority applications do not disclose the general concept of a method of managing female bovine mammals comprising each of the steps of managing a plurality of female bovine mammals for a reproductive factor, inducing early puberty in said plurality of female bovine mammals, inseminating substantially all of the female bovine mammals with sex-sorted spermatozoa, producing offspring comprising substantially all female offspring and harvesting substantially all of said plurality of female bovine mammals.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 28, 30-40, 45, 46, 49 and 50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. Claims 28, 30-40, 45, 46, 49 and 50 are indefinite over the recitation of "managing said plurality of bovine female mammals for at least one reproductive factor." It is unclear as to what is intended to be meant by managing an animal for a reproductive factor. It is also unclear as to how this step is intended to be related to the remainder of the recited steps because the claims do not set forth how the female bovine are managed based on the reproductive factor and do not state the relationship between the reproductive factor and the remaining steps of inducing early puberty, fertilizing an egg, producing offspring and harvesting the female bovine.

B. Claim 45 is indefinite over the recitation of "unsexed spermatozoa" because this phrase is not clearly defined in the specification and there is no art recognized definition for this phrase. It is also unclear as to what constitutes a "typical number of unsexed spermatozoa." While the specification refers to "typical number" of unsorted spermatazoa, the specification does not define what is intended to be encompassed by a "typical number of unsexed spermatozoa."

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 28, 31-40, 45, 46, 49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ereth (Proceedings Western Section, American Society of Animal Science. June 2000. 51: 441-443).

Ereth (page 442) teaches a method of managing a plurality of female bovine mammals comprising obtaining a plurality of female bovine mammals, managing the female bovine for a reproductive factor (i.e., managing the female bovine for their ability to reproduce), inducing early puberty in the female bovine, fertilizing at least one egg wherein fertilization is performed by artificial insemination using sex-sorted sperm, and producing female offspring from said bovine female mammals prior to the typical age of puberty.

Ereth does not exemplify a method wherein, following producing offspring, the female bovine are harvested.

However, Ereth (page 441) teaches the concept of a "single-calf heifer system (SCH)" which is designed to allow a heifer to produce one calf prior to harvest. Ereth (page 441) states that "(i)ntegrating early weaning with the single-calf heifer system may generate profit by decreasing costs of herd dams and increasing value of cull heifers." The reference (page 441) also states that "(e)arly puberty permits early insemination and is the key to the IS allowing for shorter days on feed as well as avoidance of carcass maturity problems." Further, Ereth (page 442) teaches that "(i)ntegration of early weaning, sexed semen, and single-calf heifer systems has the potential to create extra revenue for a producer by increasing value of non-replacement heifers while simultaneously decreasing feed costs to herd dams. By accomplishing the previous, the IS has the potential to generate profit."

At page 443, Ereth teaches that "Phase I of the integration of early weaning, sexed semen and single-calf heifer systems achieved increased BCS of dams; accomplished satisfactory gain performance of heifers which enabled induction of early puberty and resulted in 9 mo old heifers impregnated to sexed semen." Ereth (page 443) concludes that "(e)xploration of the complete system including and extending beyond phase I will achieve a better analysis of the IS potential to increase value of cull heifers."

Accordingly, It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Ereth so as to have included the additional step of harvesting the female bovine following the production of offspring in order to have provided a complete system which integrated the induction of

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early puberty, early weaning, use of sex-sorted sperm and the single heifer replacement system, thereby allowing for the analysis of the complete system and potentially providing the advantage of producing an integrated system with increased profits.

Regarding claim 31, Ereth teaches using 3 million frozen-thawed spermatozoa (see page 442, column 2).

Regarding claim 32, Ereth (abstract) teaches inducing early puberty by 9 months of age (i.e., prior to about 270 days after birth).

Regarding claim 33, Ereth (page 442) teaches that induction of early puberty was accomplished by feeding the female bovine a sufficient ration of feed to produce an average weight gain of about 1.25 kg/day (i.e., "about 1.3 kg/day to about 1.4 kg/day").

Regarding claim 34, Ereth (pages 441 and 442) teaches early weaning of offspring in order to perpetuate the integrated system.

Regarding claim 35, Ereth (page 42) teaches early weaning at about 110 days after birth.

Regarding claim 36, Ereth (page 442) teaches synchronization of heifers at 250 days after birth using a synchronization program that lasted 35 days, and in which AI was performed up to 72 hours following the last PGF-2alpha injection. It is stated that a 45 day breeding period allowed heifers 3 opportunities for AI. Accordingly, Ereth teaches artificial insemination and fertilization of at least one egg at about 285 to 316 days after birth.

Regarding claims 37 and 38, Ereth (page 442) teaches synchronizing estrous by dressing animal feed with 0.5 mg MGA for 14 days and injecting PGF-2alpha 19 days following the last MGA feeding.

Regarding claims 39 and 40, Ereth (page 441) teaches that the female bovine should be harvested following the production of offspring, at an age in which the female bovine are about 24 months of age.

Regarding claim 45, Ereth teaches using 3 million sex-sorted sperm, which is considered to be 50% of a typical artificial insemination dosage of 10 million sperm.

Regarding claim 46, the method of Ereth can be used to produce female offspring at a percentage of 70% female offspring, about 80% female offspring, or about 90% female offspring.

Regarding claim 49, Ereth teaches that the single-calf heifer system includes producing one calf prior to harvest and replacing the harvested female bovine.

Regarding claim 50, Ereth (page 441) teaches that the method is one in which a female bovine produces offspring in a single parturition.

6. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ereth (Proceedings Western Section, American Society of Animal Science. June 2000. 51: 441-443) in view of Seidel (1997; cited in the IDS).

The teachings of Ereth are presented above. Ereth does not exemplify a method of using live, non-frozen sperm.

However, Seidel et al (page 1261-1262) teach a method which includes the steps of: a) producing a female bovine mammal; b) inseminating said female bovine mammal

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with a sample containing sorted sperm at a purity of about 90% for X sorted sperm; c) fertilizing at least one egg within the mammal; and d) producing an offspring mammal.

Seidel teaches using $1-2.5 \times 10^5$ sorted live sperm for each artificial insemination.

Seidel also states that the use of low doses of frozen semen show considerable promise for commercial applications (see page 1262).

In view of the teachings of Seidel (1997), it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Ereth so as to have used live, non-frozen sperm in situations in which the sperm could be used immediately after sorting because this would have prevented any damage that may occur to the sperm during freezing and thawing, thereby improving the effectiveness of the artificial insemination method.

7. Claims 28, 32-37, 39, 40, 46, 49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ereth (Journal of Animal Science. 2000. Vol. 78, supplement 2, page 114, abstract 73).

Ereth teaches a method of managing a plurality of female bovine mammals comprising obtaining a plurality of female bovine mammals, managing the female bovine for a reproductive factor (i.e., managing the female bovine for their ability to reproduce), inducing early puberty in the female bovine, fertilizing at least one egg wherein fertilization is performed by artificial insemination using sex-sorted sperm, and producing female offspring from said bovine female mammals prior to the typical age of puberty.

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Ereth does not exemplify a method wherein, following producing offspring, the female bovine are harvested.

However, Ereth teaches the concept of a "single-calf heifer system (SCH)" which is designed to allow a heifer to produce one calf prior to harvest. Ereth also teaches that "Phase I of IS included early weaning, estrous synchronization and AI". It is stated that "Phase I of the IS increased BCS of dams, enabled greater gains and weights of heifers, induced early puberty and resulted in 9 mo old heifers pregnant to sexed semen."

Accordingly, It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Ereth so as to have included the additional step of harvesting the female bovine following the production of offspring in order to have provided a complete system which integrated the induction of early puberty, early weaning, use of sex-sorted sperm and the single heifer replacement system, thereby allowing for the analysis of the complete system and potentially providing the advantage of producing an integrated system with increased profits.

Regarding claim 32, Ereth (abstract) teaches inducing early puberty by 9 months of age (i.e., prior to about 270 days after birth).

Regarding claim 33, Ereth (page 442) teaches that induction of early puberty was accomplished by feeding the female bovine a sufficient ration of feed to produce an average weight gain of about 1.2 kg/day (i.e., "about 1.3 kg/day to about 1.4 kg/day").

Regarding claim 34, Ereth (pages 441 and 442) teaches early weaning of offspring in order to perpetuate the integrated system.

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Regarding claim 35, Ereth (page 42) teaches early weaning at about 110 days after birth.

Regarding claim 36, Ereth teaches artificial insemination and fertilization of at least one egg at about 293 days after birth.

Regarding claims 37, Ereth teaches synchronizing estrous using a MGA/PGF protocol.

Regarding claims 39 and 40, Ereth (page 441) teaches that the female bovine should be harvested following the production of offspring, at an age in which the female bovine are about 24 months of age.

Regarding claim 46, the method of Ereth can be used to produce female offspring at a percentage of 70% female offspring, about 80% female offspring, or about 90% female offspring.

Regarding claim 49, Ereth teaches that the single-calf heifer system includes producing one calf prior to harvest and replacing the harvested female bovine.

Regarding claim 50, Ereth (page 441) teaches that the method is one in which a female bovine produces offspring in a single parturition.

8. Claims 30 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ereth (Journal of Animal Science. 2000: Vol. 78, supplement 2, page 114, abstract 73). in view of Seidel (1997; cited in the IDS).

The teachings of Ereth are presented above. Ereth does not exemplify a method of using no more than 3 million live, non-frozen sperm.

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However, Seidel et al (page 1261-1262) teach a method which includes the steps of: a) producing a female bovine mammal; b) inseminating said female bovine mammal with a sample containing sorted sperm at a purity of about 90% for X sorted sperm; c) fertilizing at least one egg within the mammal; and d) producing an offspring mammal. Seidel teaches using $1-2.5 \times 10^5$ sorted live sperm for each artificial insemination. Seidel also states that the use of low doses of frozen semen show considerable promise for commercial applications (see page 1262).

In view of the teachings of Seidel (1997), it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Ereth so as to have used live, non-frozen sperm in situations in which the sperm could be used immediately after sorting because this would have prevented any damage that may occur to the sperm during freezing and thawing, thereby improving the effectiveness of the artificial insemination method.

Regarding claim 45, the use of $1-2.5 \times 10^5$ sorted live sperm is considered to be less than 50% of a typical artificial insemination dosage of 10 million sperm.

9. Claims 31 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ereth (Journal of Animal Science. 2000. Vol. 78, supplement 2, page 114, abstract 73). in view of Seidel (1995; abstract 513, 'Insemination of heifers with very low numbers of frozen spermatozoa,' cited in the IDS of 6/12/01).

The teachings of Ereth are presented above. Ereth does not exemplify a method of using no more than 3 or 5 million frozen, thawed sperm.

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Seidel (1995) teaches the effective insemination of heifers with thawed frozen sperm. The reference teaches that no differences were observed when using $1-5 \times 10^5$ versus 10×10^6 sorted sperm.

In view of the teachings of Seidel (1995), it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Ereth so as to have used $1-5 \times 10^5$ thawed-frozen sperm because this would have provided a convenient means for performing the insemination procedure in which the sperm could be sorted and stored prior to its use for artificial insemination.

Regarding claim 45, the use of $1-5 \times 10^5$ sorted sperm is considered to be less than 50% of a typical artificial insemination dosage of 10 million sperm.

10. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ereth (Journal of Animal Science. 2000. Vol. 78, supplement 2, page 114, abstract 73). in view of Deutscher (cited in the IDS of 6/12/01).

The teachings of Ereth are presented above. Ereth states that the female bovine were synchronized using a MGA/PGF protocol, but does not specifically teach synchronizing estrous by dressing animal feed with 0.5 mg MGA for 14 days and injecting PGF at 19 days following the last MGA feeding.

However, Deutscher teaches synchronizing estrous by dressing animal feed with 0.5 mg MGA for 14 days and injecting PGF at 19 days following the last MGA feeding (see page 165). The reference teaches that this method of synchronizing heifers results in an increased pregnancy rate (see page 164).

In view of the teachings of Deutscher, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Ereth so as to have synchronized estrous by dressing animal feed with 0.5 mg MGA for 14 days and injecting PGF at 19 days following the last MGA feeding order to have achieved the advantage set forth by Deutscher of increasing the pregnancy rates and thereby providing an effective method for managing cows.

11. Claims 28, 32, 33, 39, 40, 46, 49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hohenboken (Theriogenology, 1999, 52: 1421-1433; cited in the IDS of 6/12/01) in view of Petit (1975; cited in the IDS of 6/12/01) and Hall (Journal of Animal Science, 1997, 1606-1611; cited in the IDS of 6/12/01).

Hohenboken teaches a method of managing a plurality of female bovine mammals comprising obtaining a plurality of female bovine mammals, managing the female bovine for a reproductive factor (i.e., managing the female bovine for their ability to reproduce), fertilizing at least one egg of said female bovine wherein fertilization is performed by artificial insemination using sex-sorted sperm, producing female offspring from said bovine female mammals, and harvesting said female bovine following the production of offspring (see abstract and pages 1426 and 1428). Hohenboken teaches that use of sex semen to produce only one heifer calf allows for only one parturition per female and that most cows would be slaughtered at a young age to produce consumer-acceptable beef without a maturity discount (page 1428). It is further stated that "(i)n a favorable marketing environment and under conditions allowing first parturition at a younger age, sexed semen would help to achieve profitable SSBH beef production"

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(see page 1428). Additionally, Hohenboken (page 1426) states that mating younger cows would have the additional advantage of reducing calving difficulty and increasing calf survival.

Hohenboken does not exemplify a method of inducing early puberty in order to allow for the fertilization of younger cows.

However, Petit teaches that heifers vary with respect to the start of their first estrus. It is stated that in beef heifers, providing an improved nutrition from birth onwards results in an early onset of estrus and an increase in weight gain (see page 158). Petit teaches that inducing early puberty to produce early-maturing heifers is a means for managing animals so as to enhance their reproductive efficiency.

Additionally, Hall teaches inducing early puberty in heifers by causing a rapid weight gain then a slow weight gain for heifers at ages 6.5 months to 12.5 months (see for example page 1607). Hall teaches that inducing puberty is a means for managing animals so as to enhance their reproductive efficiency.

In view of the teachings of Petit and Hall, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Hohenboken so as to have induced early puberty in the female bovines that were to be artificially inseminated in order to have achieved the advantage set forth by Hall of enhancing their reproductive efficiency and the advantages discussed by Hohenboken of reducing calving difficulty, increasing calf survival and providing female bovine that could be harvested at a younger age, thereby providing consumer-acceptable beef without a maturity discount and improving the effectiveness of the integrated system.

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Regarding claim 32, Hohenboken does not teach inducing early puberty at about 270 days. However, Hall teaches inducing early puberty by about 9.5 months of age (i.e. about 270 days after birth). Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made induced early puberty at a time of about 270 days after birth, depending on the breed of heifer, in order to have provide the most effective integrated breeding system.

Regarding claim 33, the combined references do not specifically teach inducing early puberty by feeding the female bovine a sufficient ration of feed to produce an average weight gain of about 1.2-1.4 kg/day. However, Petit teaches that an improved level of nutrition, and thereby weight gain, induces early puberty and Hall teaches that increased weight gain induces early puberty. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have optimized the amount of food given to the female bovine in order to have produced the most effective average weight gain, including an average weight gain of about 1.2 –1.4 kg/day, in order to have achieved the advantage of inducing early puberty. As discussed in MPEP 2144.05(b), "(w)here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955).

Regarding claims 39 and 40, Hohenboken teaches that the female bovine should be harvested following the production of offspring, at an age in which the female bovine are about 24 months of age.

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Regarding claim 46, the method of Hohenboken can be used to produce female offspring at a percentage of 70% female offspring, about 80% female offspring, or about 90% female offspring.

Regarding claim 49, Hohenboken (page 1428) teaches that the single-calf heifer system includes producing one calf prior to harvest and replacing the harvested female bovine.

Regarding claim 50, Hohenboken (page 1428) teaches that the method is one in which a female bovine produces offspring in a single parturition.

12. Claims 30 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hohenboken in view of Petit and Hall, and further in view of Seidel (1997).

The teachings of Hohenboken, Petit and Hall are presented above. The combined references do not teach a method in which the quantity of sperm to be used for artificial insemination is no more than 3 million live, non-frozen sperm.

However, Seidel et al (page 1261-1262) teach a method which includes the steps of: a) producing a female bovine mammal; b) inseminating said female bovine mammal with a sample containing sorted sperm at a purity of about 90% for X sorted sperm; c) fertilizing at least one egg within the mammal; and d) producing an offspring mammal. Seidel teaches using $1-2.5 \times 10^5$ sorted live sperm for each artificial insemination. Seidel also states that the use of low doses of frozen semen show considerable promise for commercial applications (see page 1262).

In view of the teachings of Seidel, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of

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Hohenboken so as to have used live, non-frozen sperm in situations in which the sperm could be used immediately after sorting because this would have prevented any damage that may occur to the sperm during freezing and thawing, thereby improving the effectiveness of the artificial insemination method.

Regarding claim 45, the use of $1-2.5 \times 10^5$ sorted live sperm is considered to be less than 50% of a typical artificial insemination dosage of 10 million sperm.

13. Claims 31 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hohenboken in view Petit and Hall, and further in view of Seidel (1995).

The teachings of Hohenboken, Petit and Hall are presented above. The combined references do not teach a method in which the quantity of sperm to be used for artificial insemination is no more than 3 or 5 million frozen, thawed sperm.

However, Seidel (1995) teaches the effective insemination of heifers with thawed frozen sperm. The reference teaches that no differences were observed when using $1-5 \times 10^5$ versus 10×10^6 sorted sperm.

In view of the teachings of Seidel (1995), it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Hohenboken so as to have used $1-5 \times 10^5$ thawed-frozen sperm because this would have provided a convenient means for performing the insemination procedure in which the sperm could be sorted and stored prior to its use for artificial insemination.

Regarding claim 45, the use of $1-5 \times 10^5$ sorted sperm is considered to be less than 50% of a typical artificial insemination dosage of 10 million sperm.

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14. Claims 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hohenboken, Petit and Hall and further in view of Grimes (1991; cited in the IDS of 6/12/01).

The teachings of Hohenboken, Petit and Hall are presented above. The combined references do not teach do not teach early weaning of the female bovine.

However, Grimes (pages 468 and 471) teaches methods in which calves are weaned at 110 or 222 days. Grimes teaches that early weaned calves consumed less food and thereby provide an economic advantage. Grimes also teaches harvesting the animals prior to 24 months (Table 3). At pages 471, Grimes states: "Early weaning could be used in an integrated production system to expedite the finishing phase and to slaughter younger animals. It also could be used to accelerate development of females who are to be placed into the breeding herd, thus allowing these females to be bred younger."

In view of the teachings of Grimes, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the method of Hohenboken so as to have weaned the calves early, particularly after 110 days, in order to have provided the advantage set by Grimes of provide a more economical method for managing cows.

15. Claims 36, 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hohenboken, Petit and Hall and further in view of Deutscher (cited in the IDS of 6/12/01).

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The teachings of Hohenboken, Petit and Hall are presented above. The combined references do not teach synchronizing estrus in the bovine prior to artificial insemination.

However, Deutscher teaches synchronizing estrous by dressing animal feed with 0.5 mg MGA for 14 days and injecting PGF at 19 days following the last MGA feeding (see page 165). The reference teaches that this method of synchronizing heifers results in an increased pregnancy rate (see page 164).

In view of the teachings of Deutscher, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Hohenboken so as to have synchronized estrous by dressing animal feed with 0.5 mg MGA for 14 days and injecting PGF at 19 days following the last MGA feeding order to have achieved the advantage set forth by Deutchser of increasing the pregnancy rates and thereby providing a more effective method for managing cows.

Regarding claim 36, modification of the method of Hohenboken so as to have induced early puberty at about 9 months and to have included the synchronization method of Deutscher would have resulted in a method in which artificial insemination and fertilization of at least one egg occurred between about 283 to 316 days after birth.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carla Myers whose telephone number is 571-272-0747. The examiner can normally be reached on Monday-Thursday (6:30-5:00).

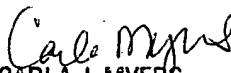
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Carla Myers

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CARLA J. MYERS
PRIMARY EXAMINER